

# Repairing analog watches

## GP 350 GIRARD-PERREGAUX

(incl. GP 351, 352, 353)

### 1. EXPLANATION OF OPERATION

**The power cell** – The power cell is of the standard mercury type. It measures 11.6 mm in diameter and is 5.2 mm thick. Its initial voltage is 1.35 V – enough to power the Girard-Perregaux quartz wristwatch. The power cell must be replaced once a year.

**The quartz** – The current is supplied by the power cell, through the integrated circuit. The frequency of the GP quartz is 32,768 Hz or cycles per second.

**Regulation** – The frequency can be modified by a slight turn of the trimmer capacitor screw, correcting the accuracy of the watch by fractions of a second a day.

**Integrated circuit (IC)** – It contains the equivalent of 312 transistors of the MOS type on a surface of some 5 mm<sup>2</sup> (.0077 sq.in.).

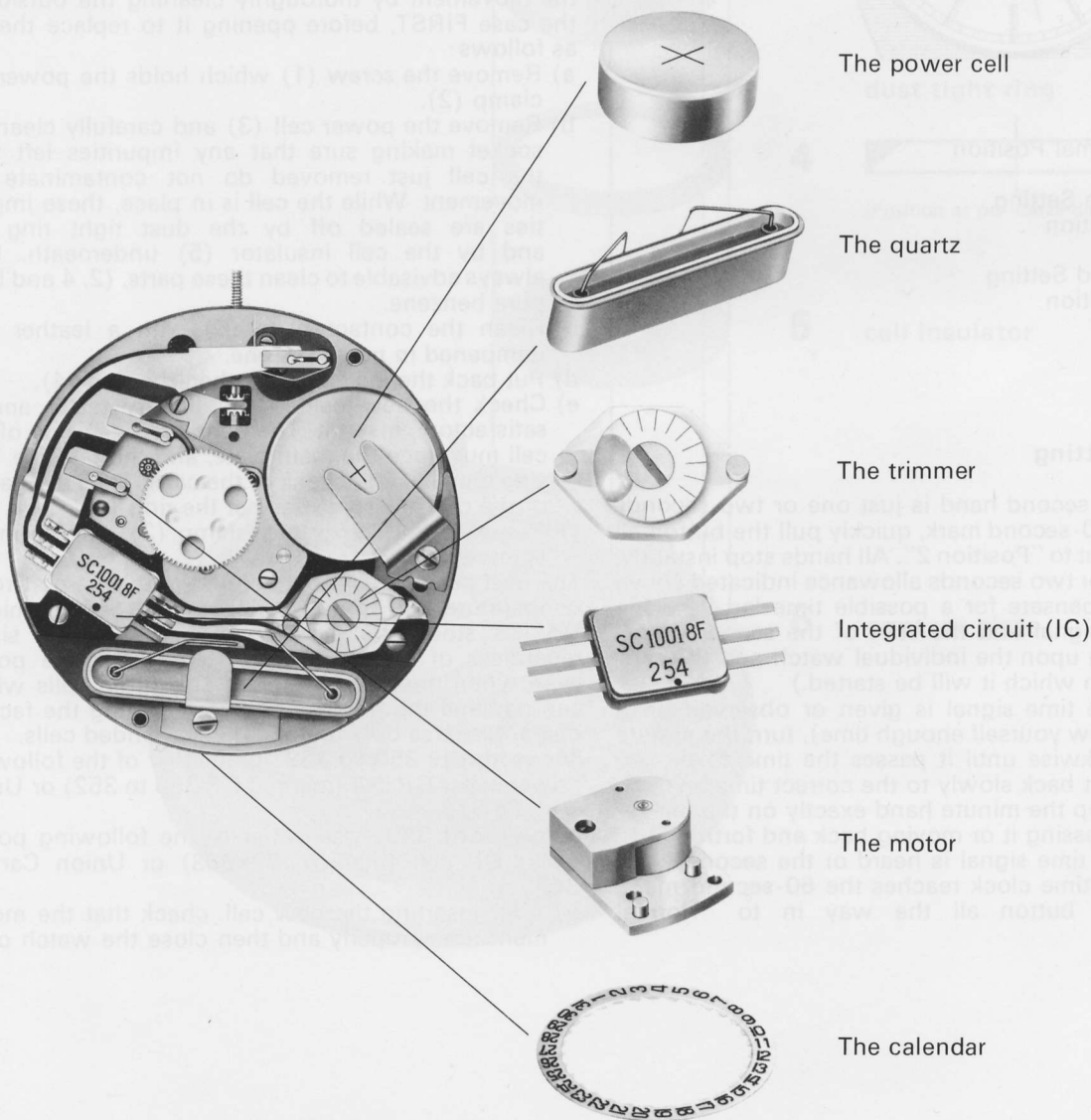
The three functions of the electronic circuitry are:

1. To maintain the oscillations of the quartz.
2. To divide the basic frequency from 32,768 Hz down to .5 Hz.
3. To shape and amplify the .5 Hz signal and feed it to the motor.

**The motor** – The motor is of the stepping type. It drives the hour, minute and second hands, as well as the date indicator.

Swiss Patent # 514181 - US pat. no. 3652884 - other pats. pending in France, Germany, Japan, Switzerland.

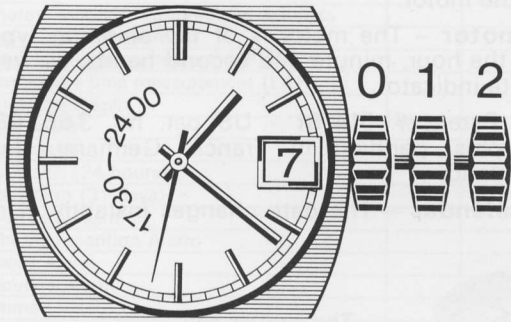
**The calendar** – The date changes instantly at midnight.



## 2. DATE AND HAND SETTING

### A. Date Setting

Pull button halfway out to "Position 1" but **do not change the date when the hour hand is between 6 p.m. and midnight**. A full clockwise turn of the button will change the date by one day. Do this as many times as necessary until the correct date appears. This will not affect the accuracy of the hands. As soon as the correct date appears in the window, **reverse the rotation of the button by at least one full turn** - to disengage the manual date setting mechanism - and press button back to "Position 0".



0 = Normal Position

1 = Date Setting Position

2 = Hand Setting Position

### B. Hand Setting

- When the second hand is just one or two seconds past the 60-second mark, quickly pull the button all the way out to "Position 2". All hands stop instantly. (The one or two seconds allowance indicated above is to compensate for a possible time lag between the time signal and the start of the second hand, depending upon the individual watch and the precision with which it will be started.)
- Before the time signal is given or observed on a clock (allow yourself enough time), turn the minute hand clockwise until it passes the time to be set, then turn it back slowly to the correct time, making sure to stop the minute hand exactly on the marker without passing it or moving back and forth.
- When the time signal is heard or the second hand of official time clock reaches the 60-second mark, press the button all the way in to "Normal Position".

## 3. CHECKING, REGULATION AND STORAGE

Use regulating equipment has designed to measure to a precision of 1/100th second a day.

The power cell of a Girard-Perregaux quartz watch can be disconnected by pulling the setting button all the way out to "Position 2", thus reducing the cell's power drain to a minimum. Quartz watches should be kept at normal room temperature, preferably with low humidity, to preserve the life of the power cells.

## 4. REPLACING THE POWER CELL

**Very important: Never handle a power cell with metal tools or with bare fingers. Acid moisture from fingers could impair the quality of electric contacts.**

Due to the fact that the Girard-Perregaux quartz movement GP # 350 does not have to be cleaned or oiled periodically, extra care must be taken to keep dirt, dust and other foreign matter away from the movement by thoroughly cleaning the outside of the case FIRST, before opening it to replace the cell as follows:

- Remove the screw (1) which holds the power cell clamp (2).
- Remove the power cell (3) and carefully clean the socket making sure that any impurities left from the cell just removed do not contaminate the movement. While the cell is in place, these impurities are sealed off by the dust tight ring (4) and by the cell insulator (5) underneath. It is always advisable to clean these parts, (2, 4 and 5) in pure benzene.
- Clean the contact plate (6) with a leather buff dampened in pure benzene.
- Put back the insulator (5) then the ring (4).
- Check the new cell in the battery tester and, if satisfactory, insert it. The negative "-" side of the cell must face the main plate, and the positive "+" side must face the back of the case. Thus the gasket of the cell must rest against the ring (4).
- Put back the power cell clamp (2), driving in the screw tightly.

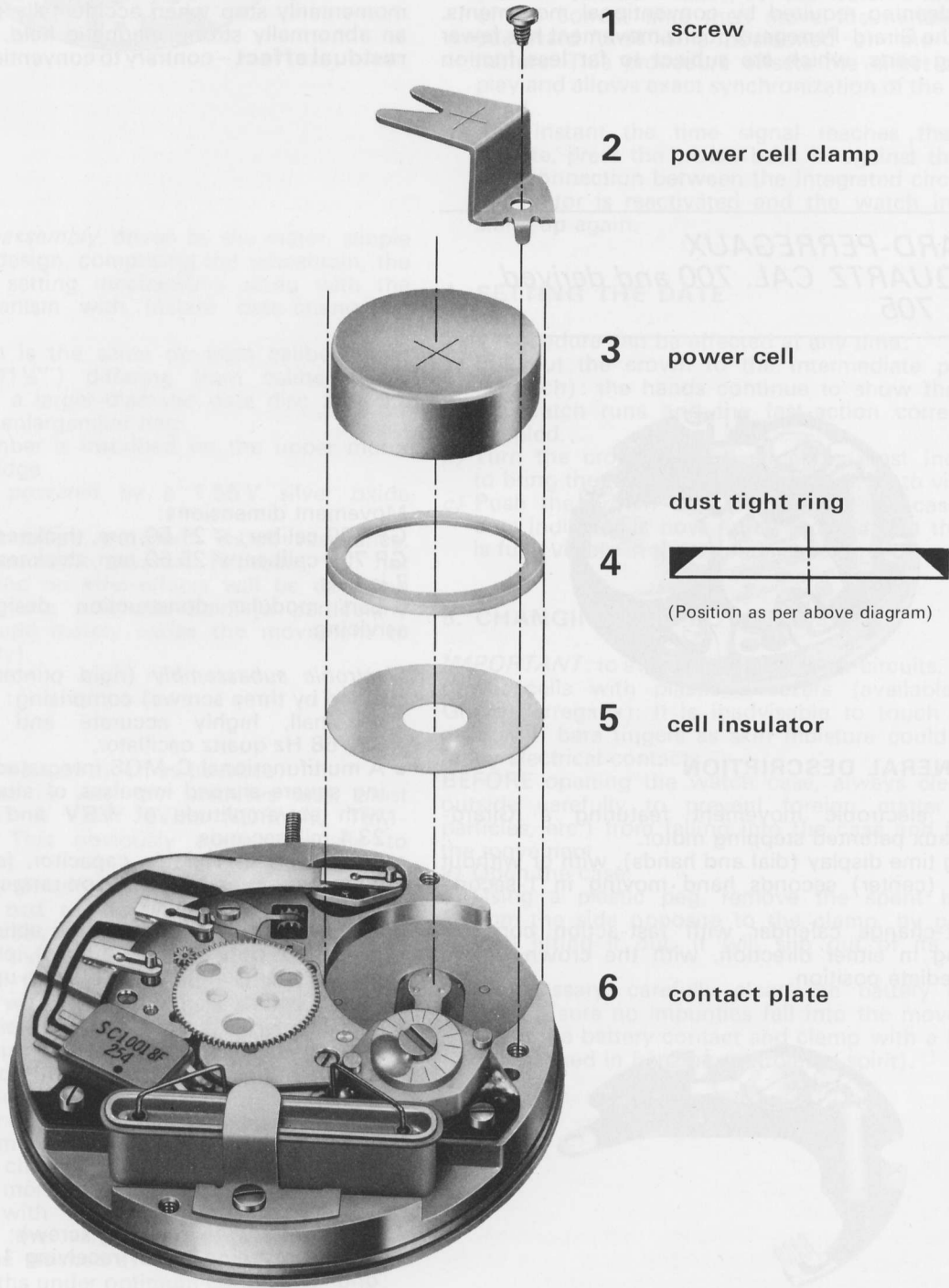
The best conditions for stocking batteries are at room temperature with preferably less than 50% humidity. Do not stock too large a quantity of cells since, regardless of brand, they will gradually lose power even when unused. Never use substitute cells which can damage the timepiece, thus nullifying the factory guarantee. Use only original recommended cells.

**Movements 350 to 352:** Use either of the following power cells: GP cell (marked GP 350 to 352) or Union Carbide 313.

**Movement 353:** Use either of the following power cells: GP cell (marked GP 353) or Union Carbide 343.

- After inserting the new cell, check that the movement runs properly and then close the watch case.

## Replacing the Power Cell



## 5. MAINTENANCE SETTING

If the second hand does not move normally when the power cell is in place, proceed as follows:  
check that the cell is inserted correctly. If so,  
check the cell on a battery tester;  
check that all contact points around the cell are clean;  
if necessary, change the cell.

Aside from the replacement of the cell once a year, the movement needs neither maintenance nor the periodical cleaning required by conventional movements. Since the Girard-Perregaux quartz movement has fewer working parts, which are subject to far less friction

and wear than ordinary movements, no oiling is required. Certain parts of the date and hand setting mechanism are lubricated permanently at the factory. Never treat the GP # 350 movement with a demagnetizer.

Magnetism does not have the same effect on the Girard-Perregaux quartz movement GP # 350 as on conventional movements. Although protected against usual magnetic hazards, the quartz watch could momentarily stop when accidentally passing through an abnormally strong magnetic field, but with **no residual effect**—contrary to conventional watches.

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